

## GENERAL

- 1 **Program name and version number** TRNSYS-TUD
- 2 **Name of organization performed the simulations** Technical University of Dresden
- 3 **Name of person performed simulations and contact information** Clemens Felsmann  
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### **Program status**

- ☐ Freeware
- ☐ Commercial
- ☒ Other: The code was developed based on commercial TRNSYS for research purposes
- 5 **Time convention for weather data: first interval in the weather input lasts 00:00-01:00, climate is assumed constant over the sampling interval**
- ☐ Yes
- ☒ No: normally inputs change linearly but solar radiation is calculated using a special smoothing function..

## CALCULATION OF BOUNDARY CONDITIONS

- 6 **Please specify the solar model for calculation of incident solar radiation**  
Perez model
- 7 **Transmission of the direct solar radiation into zone 1**
- ☐ Calculated with the constant solar heat gain coefficient (g-value)
- ☐ Calculated with the g-value as a function of incidence (function of incidence is fixed within code)
- ☐ Calculated with the g-value as a function of incidence (function of incidence is user defined)
- ☒ Other: Calculated with the g-value as a function of incidence (function of incidence was calculated by WINFOW5 Software)
- 8 **Transmission of the direct solar radiation into zone 2**
- ☒ Treated as diffuse solar radiation and calculated with the constant g-value
- ☐ Calculated with the g-value as a function of incidence (function of incidence is fixed within code)
- ☐ Calculated with the g-value as a function of incidence (function of incidence is user defined)
- ☐ Other, please specify
- 9 **Transmission of the diffuse solar radiation into zone 1**
- ☐ Calculated with the solar heat gain coefficient at the solar incidence 60°
- ☒ Other: Calculated with the solar heat gain coefficient was calculated by WINFOW5 Software
- 10 **Distribution of solar radiation to the surfaces in the zone 1**
- ☒ Distributed equally to all surfaces: diffuse radiation
- ☐ Calculated according surface area weighting
- ☒ Calculated according to solar path and view factors: direct radiation
- ☐ Other, please specify
- 11 **Distribution of solar radiation to the surfaces in the zone 2**
- ☒ Distributed equally to all surfaces because all radiation was treated as diffuse radiation
- ☐ Calculated according surface area weighting
- ☐ Calculated according to solar path and view factors

☐ Other, please specify

### **MODEL DEFINITIONS**

**12 Air temperature in the zone 1 is calculated as:**

☒ One node temperature was reported but...

☒ Few zones are stacked on the top of each other and the air temperature in each of zones is calculated, please specify number of stacked zones 4

☐ Other, please specify

**13 Air temperature in the zone 2 is calculated as:**

☒ One node temperature was reported but ...

☒ Few zones are stacked on the top of each other and the air temperature in each of zones is calculated, please specify number of stacked zones 4

☐ Other, please specify

### **HEAT EXCHANGE WITH EXTERIOR**

**14 External heat transfer coefficients**

☒ Split radiative/convective

☐ Combined radiative/ convective

☐ Other, please specify

**15 External heat transfer coefficients are calculated with identical assumptions for all surfaces (window frame, window glazing, walls etc.)**

☒ Yes

☐ No, please specify

**16 External convection**

☐ Constant coefficients fixed within code

☒ User-specified constant coefficients

☐ Calculated within code as a function of orientation

☐ Calculated within code as a function of wind speed

☐ Calculated within code as a function of wind speed and direction

☐ Other, please specify

**17 External radiative heat exchange**

☐ Assumed to be ambient temperature

☐ Assumed to be sky temperature

☒ Other: it depends on the orientation whether ambient or sky temperature will be used

### **HEAT TRANSFER WITHIN ZONES**

**18 Internal heat transfer coefficients**

☒ Split radiative/convection

☐ Combined radiative/ convective

☐ Other, please specify

**19 Internal heat transfer coefficients are calculated with identical assumptions in all zones and for all surfaces (window frame, window glazing, walls etc.)**

☒ Yes

☐ No, please specify

**20 Internal convection**

- ☐ Constant coefficients fixed within code
- ☒ User-specified constant coefficients
- ☐ Calculated within code as a function of orientation (vertical/horizontal)
- ☐ Calculated within code as a function of temperature difference
- ☐ Calculated within code as a function of air velocity in the zone
- ☐ Calculated within code as a function of surface finishes
- ☐ Other, please specify

**21 Longwave radiation exchange within zone**

- ☐ Constant linearized coefficients
- ☐ Linearized coefficients based on view factors
- ☐ Linearized coefficients based on surface emissivities
- ☒ Nonlinear treatment of radiation heat exchange
- ☐ Other, please specify

**WINDOW**

**22 Window**

- ☐ Window frame and glazing are modelled as separate elements of construction
- ☐ Window frame and glazing are modelled as separate elements of construction, but the total U-value is calculated within the code
- ☒ Window frame and glazing are modelled as separate elements of construction, but the total U-value and g-value are calculated within the code
- ☐ Other, please specify

**23 Glazing temperature**

- ☒ Calculated for 1 nodal point on the basis of fixed resistance
- ☐ Calculated dynamically, using the same scheme as for opaque elements
- ☐ Other, please specify

**AIRFLOW MODEL**

**24 Discharge coefficient**

- ☐ Fixed within the code
- ☒ User-specified fixed value
- ☐ Calculated by code, please specify what are the parameters involved in code calculations
- ☐ Other, please specify

**25 Pressure difference coefficients**

- ☐ Fixed within the code, identical for all openings sharing the same surface
- ☐ User-specified, identical for all openings sharing the same surface
- ☒ User-specified for every opening
- ☐ Other, please specify

**26 Calculated mass flow rate in the model is a function of**

- ☒ Buoyancy force
- ☒ Wind pressure
- ☐ Wind turbulence
- ☐ Other, please specify